

REMARKS

Claims 1-4 have been canceled. New Claims 5-13 are pending in the application.  
Reconsideration is respectfully requested.

The present invention relates to a curable liquid composition that functions as an adhesive in various applications.

Specification Amendments

The specification in several places has been amended to make minor spelling corrections thereto. None of the corrections introduce new matter into the case. Entry of the amendments is respectfully requested.

Claim Amendments

New Claim 5 is a substitute for original Claim 1 and is supported by Claims 1 and 2, page 7, line 18, pages 11 and 12 and pages 15 to 18 of the specification. Pages 11 and 12 also provide support for new Claims 6 and 7, while pages 16 and 17 provide support for new Claim 8. Original Claim 3 provides support for new Claim 9 and Example 1 provides support for new Claims 11 and 13. Support for new Claims 10 and 12 can be found on page 21. None of the new claims introduces new matter into the case. Entry of the new claims is respectfully requested.

Claim Rejection, 35 USC 112 & 35 USC 101

The rejection of Claim 4 over the second paragraph of 35 USC 112 and the provisions of 35 USC 101 are believed obviated by the cancellation of the claim. Withdrawal of the rejection is respectfully requested.

Claim Rejection, 35 USC 102

The rejection of Claims 1-4 as anticipated by the Chawla et al '870 patent is obviated by the cancellation of Claim 1 in favor of new Claim 5. The new claim requires the preparation of a urethane (meth)acrylate by the reaction of polypropylene glycol and a hydroxyl-containing (meth)acrylate and a polyisocyanate. On the other hand, the patent discloses a curable liquid resin that is prepared by the reaction of a polyol compound having a structure containing as structural units, the bivalent radicals of formulas (I) and (II), a polyisocyanate and at least one hydroxyl group containing (meth)acrylate. The number average molecular weights described in examples are 4750, 5840, 7120, 1850 and 5840, which are less than 10000. Accordingly, an important distinction between the reference and the present claims is that the polypropylene glycol is not shown in the examples of the compositions of the patent and that the polyol of component (A) is not essential as required by the patent

As to new Claims 10 and 12, Chawla et al does not disclose or suggest the adhesive bonding between MS plate and a PET film, nor providing the adhesive bonding between PET films. Accordingly, the patent does not anticipate the present claims and withdrawal of the rejection is respectfully requested.

Claims 1, 3 and 4 stand rejected based on 35 USC 102 as anticipated by Saunda et al, JP 07-310067. This ground of rejection is respectfully traversed.

Saunda et al discloses a curable liquid adhesive composition. However, an important distinction of the present claims over the disclosure of the patent is that the reference does not teach or suggest component (A) of the present claims which must have a number average molecular weight of 10000 to 40000. On the other hand, in Saunda et al, the number average molecular weights described for examples are 8814, 7008 and 4620, which are all less than 10000. Moreover, the patent discloses the required use of an acrylate compound of formula

(I), while the present claims specifically exclude this acrylate compound (formula (5)) from the liquid composition of this invention.

Saunda et al discloses a method of adhesively bonding PVC films together and of bonding a PVC film to a PET film, but is silent as to promoting the adhesive bonding between an MS plate and between PET films. Accordingly, the patent does not anticipate the present claims and withdrawal of the rejection is respectfully requested.

The rejection of Claim 2 based on 35 USC 103 is obviated by the cancellation of the claim from the record. Withdrawal of the rejection is respectfully requested.

Claims 1-4 stand rejected based on 35 USC 102 as anticipated by Yamamura et al, U.S. Patent 6,191,187. This ground of rejection is respectfully traversed.

Yamamura et al discloses a coating composition which is primarily useful in the coating of optical glass fibers. The composition contains a urethane acrylate component. However, the urethane acrylate is not the same as the specific urethane acrylate component (A) of the present invention. That is, while the urethane (meth)acrylate component (A) of the present claims must have a minimum number ave molecular weight of 10000, the patent in the example discloses a urethane (meth)acrylate having a number ave molecular weight of 4750. The urethane acrylate exemplified in the patent is not made from reactants which comprise polypropylene glycol as a reactant. Rather, the ring opened copolymer of tetrahydrofuran and 3-methyl tetrahydrofuran is employed as a reactant with tolylene diisocyanate.

It further should be noted that the reference is silent as to the use of the disclosed composition for adhesively bonding films of PET together or bonding an MS plate with a PET film. Accordingly, the reference does not anticipate the invention and withdrawal of the rejection is respectfully requested.

Claims 1, 3 and 4 stand rejected based on 35 USC 102 as anticipated, each independently, by Taki, JP 07-292323 and JP 07-286019, Honjo et al, JP 63-215707 and JP 63-130608, Kobayashi et al, JP 06-171051, Takahashi et al, JP 11-100419, Maruyama et al, JP 11-302342, Suzuki et al JP 2000-086936, Baba et al, JP 08-127630 and Takahashi et al, WO 00/09620. This ground of rejection is respectfully traversed.

The Taki et al '323 reference discloses a radiation curable adhesive composition that is comprised of a urethane acrylate that is prepared by reacting a polyisocyanate with a polymerizable compound having a mol wt of < 500 and a compound having one or more (meth)acryloyloxy groups and one or more hydroxyl groups. In the '323 reference each urethane acrylate resin is prepared by using a copolyesterpolyol that contains an aromatic dicarboxylic acid. Propylene glycol is not disclosed as a polyol reactant. Further, the reference does not disclose the present component (C) as a reactant.

While '323 discloses the use of the curable liquid composition for the adhesion of PET films, clearly, because the curable liquid resin composition of the invention is different from that of the reference, the adhesive bonding claims of the present application define different methods than those of the reference.

As to the '6019 reference, the same discloses the radiation curable adhesive composition that is disclosed in the '323 reference. Accordingly, the same argument against the rejection of the present claims is maintained. Further, while the reference discloses that the radiation curable adhesive composition adheres to metal and to a plastic such as PET, it does not disclose a method of bonding an MS plate or a PET film to a PET film. Accordingly, the reference does not anticipate the invention and withdrawal of the rejection is respectfully requested.

Honjo et al '707 discloses a UV radiation curable adhesive composition. In '707 the urethane acrylate is prepared by the use of a polytetramethylene glycol or a copolymer of

tetrahydrofuran and propylene oxide that has hydroxyl groups at both ends thereof, but does not disclose polypropylene glycol. Also, the '707 reference in the upper left column of page 4 that the content of acryloylmorpholine, which corresponds to component (B) of the present claims, is 5 to 40 wt % based on 100 wt % of the urethane acrylate component. That is, the maximum content of acryloylmorpholine in the curable resin is approximately  $40/140 \times 100 = 28$  wt %. The reference states that if the maximum content of acryloylmorpholine exceeds 40 wt %, then the property of the ability of the product to absorb water is increased too far. Therefore, the composition taught by the reference is outside the scope of the present claims.

While the reference discloses that the curable liquid composition described therein is useful for the coating of optical fibers, the use of such a composition for the adhesive bonding of an MS plate to PET film is not taught, nor the adhesive bonding of PET films.

Since the disclosure of the Honjo et al '608 reference is the same as that of the '707 reference, the same arguments stated above apply in the refutation of the '608 based rejection.

The Kobayashi et al '051 reference discloses a sheet support by which a curable resin composition is coated on a paper sheet substrate. The reference does not disclose any materials that are necessary to form a urethane resin. Furthermore, the reference does not disclose component (C) of the present claims.

Kobayashi et al discloses a composition that is suitable for coating paper or a plastic film. It does not, however, disclose either of the methods of present claims 10 and 12. Withdrawal of the rejection is respectfully requested.

Takahashi et al '419 discloses a radiation curable adhesive composition that is useful as an adhesive in bonding to disks. The reference does not specifically disclose the use of the urethane acrylate resin composition of component (A) of the present claims. In the examples of the reference urethane acrylate resins are prepared by reacting polytetramethylene glycol, a

polyester diol or a polyether diol, but do not disclose the use of polypropylene glycol as a reactant. The polyol reactants respectively have number average molecular weights of 1650, 1530 and 2570, each value being less than 10000. Further, the reference discloses a method of providing adhesion to polycarbonate, aluminum and gold substrates, but the adhesive bonding methods of present Claims 10 and 12 are not shown or suggested.

Maruyama discloses a radiation curable resin composition. The reference also discloses a urethane resin that is unsaturated, but does not specifically disclose or suggest the use of present component (A). The reference further describes the use of a hydroxyl group-containing polyester as a reactant, but not polypropylene glycol, as a polyol that has a weight average molecular weight of 1800, which is well less than the 10000 minimum of the present claims. Also the disclosure fails to show or suggest component (C) of the present claims.

As to the matter of utility, the reference mentions that the resin composition may be applied to a substrate of plastic as in a lacquer or paint. It does not specifically disclose the methods of either present Claim 10 or Claim 12. Accordingly, withdrawal of the rejection is respectfully requested.

Suzuki et al '936 discloses a coating composition which is primarily useful in the coating of optical glass fibers. The composition contains a urethane acrylate as a radical polymerization oligomer. However, the urethane acrylate is not the same as the specific urethane acrylate component (A) of the present invention. Synthesis Example 1 of the reference discloses the preparation of the polymerizable urethane using polypropylene glycol, isophorone diisocyanate and 2-hydroxyacrylate as reactants. However, the polymer obtained only had an average molecular weight of 3300, which is well less than 10000.

The reference describes that a radical polymerizable polymer component (B) is preferably prepared from a monomer, which, as a homopolymer, has a glass transition point

of 50° C or more and a monomer, which, as a homopolymer, has a glass transition point of 20° C or less in combination. Example 2 of the reference discloses a total content B2 of isobornyl acrylate having a glass transition point, in the form of a homopolymer, of 94° C and B5 of N-acryloylmorpholine having a glass transition point, in the form of a homopolymer, of 130° C, at 27 wt %, which is well less than the 40 wt % of the present claims. Therefore, the radical polymerizable polymer (B) is outside the scope of the present claims. Also, the reference does not disclose present component (C), but only a silane coupling agent that has an oxirane ring.

As to the matter of present Claims 10 and 12, the reference describes therein that the urethane acrylate composition is useful for the coating of optical fibers, but does not show the use of such a composition for the adhesive bonding of an MS plate to PET film, nor the adhesive bonding of PET films. Accordingly, withdrawal of the rejection is respectfully requested.

Baba et al discloses a photocurable resin composition, but does not specifically disclose component (C) of the present claims. Further, as to the matter of present Claims 10 and 12, the reference discloses a method of producing a photocurable resin composition for the coating, bundling and connecting of optical fibers, but is silent as to the present method embodiments of adhesively bonding an MS plate to PET film, or of the adhesive bonding of PET films. Accordingly, withdrawal of the rejection is respectfully requested.


Finally, the Takahashi et al reference discloses a photocurable urethane (meth)acrylate that is described on page 29 as being useful as an adhesive in bonding to a variety of substrates such as polycarbonates, polymethyl(meth)acrylate, metals such as gold, and aluminum and to inorganic materials of the like of glass. The reference does not specifically disclose the use of the urethane acrylate resin composition of component (A) of the present claims. In Synthesis Example 1, the urethane acrylate resin is prepared by reacting

polytetramethylene, but does not disclose the use of polypropylene glycol as a reactant. The polyol reactant has a number average weight of 2710, which is well less than 10000. The reference, however, nowhere shows or suggests the use of the adhesive in the bonding of an MS plate to a PET film or of two or more PET films together. Accordingly, the reference does not anticipate the method embodiments of Claims 10 and 12 of the present application. Withdrawal of the rejection is respectfully requested.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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